

## REACTOR FOR PREPARING HYDROGEN COMPOUNDS

### ABSTRACT

5 A reactor is provided to produce compounds comprising at least  
one neutral, positive, or negative increased binding energy hydrogen  
species having a binding energy greater than the binding energy of the  
corresponding ordinary hydrogen species, or greater than the binding  
energy of any hydrogen species for which the corresponding ordinary  
hydrogen species is unstable or is not observed; and at least one other  
10 element. The reactor comprises a vessel containing an electron source  
and a source of increased binding energy hydrogen atoms having a  
binding energy of about  $\frac{13.6 \text{ eV}}{\left(\frac{1}{p}\right)^2}$  where  $p$  is an integer greater than 1.

Electrons from said electron source react with increased binding energy  
hydrogen atoms from said source in said vessel thereby producing said  
15 compounds. The source of increased binding energy hydrogen atoms  
may be a hydrogen catalysis cell selected from a group consisting of an  
electrolytic cell, a gas cell, a gas discharge cell, and a plasma torch cell.  
The hydrogen catalysis cell comprises a second vessel containing a  
source of atomic hydrogen; at least one of a solid, molten, liquid, or  
20 gaseous catalyst having a net enthalpy of reaction of at least  $m/2 \cdot 27$   
eV, where  $m$  is an integer, whereby the hydrogen atoms react with the  
catalyst in the second vessel thereby producing a hydrogen atom having  
a binding energy of about  $\frac{13.6 \text{ eV}}{\left(\frac{1}{p}\right)^2}$  where  $p$  is an integer greater than 1.